

**Optic Nerve Sheath Diameter:
Translating a Terrestrial Focused Technique into a Clinical Monitoring Tool for Space Flight**

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ABSTRACT

Emergency medicine physicians recently adopted the use of ultrasonography to quickly measure optic nerve sheath diameter (ONSD) as concomitant with increased intracranial pressure [1]. NASA Space and Clinical Operations Division has been using ground and on-orbit ultrasound capabilities since 2009 to consider this anatomical measure as a proxy for intracranial pressure in the microgravity environment. In the terrestrial emergency room population, an ONSD greater than 0.59 cm is considered highly predictive of elevated intracranial pressure [1]. However, this cut-off limit is not applicable to the spaceflight setting since over 50% of US Operating Segment (USOS) astronauts have an ONSD greater than 0.60 cm even before missions. Crew Surgeon clinical decision-making is complicated by the fact that many astronauts have history of previous spaceflights. Data will be presented characterizing the distribution of baseline ONSD in the astronaut corps, longitudinal trends in-flight, and the predictive power of this measure related to increased intracranial pressure outcomes.

REFERENCES

[1] Dubourg, J., Javouhey, E., Geeraerts, T., Messerer, M., & Kassai, B. (2011). Ultrasonography of optic nerve sheath diameter for detection of raised intracranial pressure: a systematic review and meta-analysis. *Intensive Care Medicine*, 37(7), 1059-1068.